

## UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner:

Group:

Attorney Docket # 1500

Applicant(s) : SCHMOLL, K., ET AL

Serial No. :

Filed :

For : PIEZOELECTRIC ACTUATOR

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708  
C. H. H. H.  
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## INFORMATION DISCLOSURE STATEMENT

February 19, 2001

Honorable Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231


S I R S:

- \_\_\_\_\_ In accordance with the Duty of Disclosure, Applicant(s) submit(s) herewith a copy of a Foreign Search Report in a counterpart application and copies of the reference(s) indicated therein.
- \_\_\_\_\_ In the event that the Foreign Search Report is in a foreign language, a translation thereof is herewith submitted.
- X   Attached hereto is a FORM PTO 1449 listing the references.
- \_\_\_\_\_ Attached hereto is a copy of a reference cited in the specification of the application as filed. The specification itself recites the relevance of these documents.
- \_\_\_\_\_ Applicant petitions for consideration of this Information Disclosure Statement since it is being submitted after receipt of an office action and submits herewith the required fee. If this fee is missing or insufficient, then authorization is given to debit the account of the undersigned: 19-4675.

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- \_\_\_\_ Attached hereto are copies of references cited which may be pertinent to this application. Since the references are in the English language, no statement of relevance is submitted.
- \_\_\_\_ Attached hereto is a copy of the Office Action issued in the corresponding German application, together with a translation thereof and copies of the references cited therein. A list of the cited references is also attached.
- \_\_\_\_ Attached hereto copies of references cited which may be pertinent to this application. An English translation of the references is also attached.
- ☒ Attached hereto is a Statement of Relevancy and copies of references cited therein.
- ☒ These references were sent to the USPTO by WIPO and are in the file of this application

Respectfully submitted,

  
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## STATEMENT OF RELEVANCY FOR PCT/DE 00/01929

JP 08-274 381 A has disclosed a piezoelectric actuator with a multilayered structure of piezoelectric layers and electrodes disposed between them. The electrodes are integrated into the layer structure in comb fashion and are alternately contacted on opposite sides from one another. The electrodes contacted on the one side do not extend all the way to the opposite side in order to prevent voltage arc-overs which could lead to a destruction of the piezoelectric actuator. This produces a neutral phase without an electrode layer in the region between two piezoelectric layers.

Based on the intrinsically known piezoelectric effect, the application of an external voltage to the piezoelectric actuator produces a mechanical reaction in the form of a tension or compression in a predictable direction. In this connection, different mechanical stresses are produced in the vicinity of the electrodes as well as in the non-contacted neutral phases. This can cause fractures to form in the piezoelectric actuator. In order to prevent this fracture formation, stress reduction elements are provided in the known piezoelectric actuator, which reduce mechanical stresses in the neutral phase. By contrast, in the subject of the invention, a mechanical stress is intentionally produced in the neutral phase.

Moreover, JP 07-183 586 A has disclosed another piezoelectric actuator with multilayered construction. For the introduction of external forces, this actuator has cover

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layers with spherical devices which cooperate with devices embodied in mirror image fashion on support plates. Due to their shape and disposition, these devices prevent the piezoelectric actuator from being destroyed in the event that external lateral forces are exerted, without, however, increasing the initial stress of the piezoelectric actuator in general and in the vicinity of the neutral phase in particular.